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ABSTRACT

Twenty-two National Skill Standards Projects were conducted to develop National Skill Standards over a 3-year period beginning in 1992. These projects were funded by the U.S. Departments of Education and Labor to develop materials useful for improving the quality of the work force through identification of skill standards and related materials tied to measurable, performance-based outcomes that can be readily assessed, be comparable across industries, similar occupations, and states. After 3 years, however, the parameters of a skill standard have not been defined and the format and presentation process have not been standardized. As a result, there will be 22 conceptually different sets of skill standards to which the technical education community will be expected to respond. Most of the standards projects did not follow accepted occupational analysis processes, nor use definitions commonly understood by occupational curriculum developers and professional training developers (such as the military and the Vocational-Technical Consortium of States standards). New work force legislation, however, is likely to "encourage" use of the skill standards, so technical educators will need to review the standards and consider implementation whenever possible. Even though a particular standards set may be of limited value, consideration of the standards material as developmental tools should be worth the effort. A suggested process would be to use the program advisory committee in a comparison of the products to known good materials and determine the usefulness on a product-by-product basis. More than likely, however, the flawed development of the skill standards projects will doom most of the products to obscurity. (A list of the skill standards projects with contact names, addresses, and telephone numbers is included in the paper.) (KC)

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National Skill Standards Projects:

Their Influence on State & Local Technical Education

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Charles Losh, Ph.D.

Presented at the American Vocational Association Conference
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22 National Skill Standard Projects:

Their Influence on

State & Local Technical Education

Charles Losh, Ph.D.

Beginning with the initial Skill Standards Projects funded by the Department of Education (DOE) and the Department of Labor (DOL) in October, 1992 through later project funding activities, we have 22 National Skill Standards Projects (Appendix A). In some cases we have products, in others, extensions have been granted to complete the standards materials. These projects were funded to develop materials useful for improving the quality of the workforce through identification of "skill standards" and related materials. A DOE-DOL document states:

> The skill standards ... must also be tied to measurable, performance-based outcomes that can be readily assessed, be comparable across industries, similar occupations, and states.

Unfortunately, more than three years after the initial project contracts, an independent contractor is still attempting to define the parameters of a "skill standard", and exactly what the definition, format and presentation process should/will be. During the past three years, however, the 22 projects progressed on their developmental mission, developing their own unique definitions, format, and presentation process.

Additionally, a National Skills Standard Board has now been selected. Their purpose is to

> ... serve as a catalyst in stimulating the development and adoption of a voluntary national system of skill standards and of assessment and certification of attainment of skill standards ... .

The Board's objectives include ensuring the development of "... the most skilled front-line workforce in the world; ...". This group will "endorse" skill standards, identify broad occupational clusters, and establish voluntary partnerships to develop standards.

This is the environment in which the National Skill Standards were developed. An environment that was ill defined at best, and with as much variability in the products as projects. Ultimately, there will be 22 conceptually different sets of skill standards to which the Technical Education community will be expected to respond. Additionally, in some instances (electronics for example) multiple projects are directed at developing standards for the same occupation. The obvious question is "which is the 'real' standard set"? An additional concern is that there will be an expectation amongst legislators and high visibility CEOs that the "workforce problem" is now solved, if only we implement the "new skill standards". This perception must be tempered with developmental reality.

Unfortunately, most of the standards projects did not follow accepted occupational analysis processes, nor use definitions commonly understood by occupational curriculum developers and professional training developers. Occupational standards development is not a new process. The military and professional training developers such as V-TECS (with a 20+ year history in this area) have extensive experience in analyzing occupations and developing skill standards for curriculum and assessment purposes.

This considerable experiential base will only be evident in a few of the products. Therefore, the vocational technical community does have a major challenge before us when these projects and "standards" projects are deemed complete by DOE and DOL.

So, what impact will the project standards have on the daily lives of technical educators, and how should we be gearing up for the challenge?

At the national level, it is clear that administrators in the DOE and DOL, along with legislators and staff, have included references to the skill standards in new workforce legislation. Use of the skill standards will be "encouraged", at a minimum. Given the large amounts of federal funds that have been allocated to these projects, technical educators will need to review the standards and consider implementation where possible. Even though a particular standards set may be of limited value, consideration of the standards material as developmental tools should be worth the effort. A suggested process would be to use the program advisory committee in a comparison of the products to known good materials (V-TECS task lists and related materials), and determine the usefulness on a product by product basis.

Verifying Skill Standards Sets Using Business-Industry Committees

The following systematic process will provide a quality skill standard set, which in turn will provide the basis for the development of quality assessments and associated instructional delivery system.

The first step is to identify five to nine workers and direct supervisors to represent the occupation for a skill list validation committee. Obvious sources of individuals for this activity are members of state or local advisory groups, but selection must be done carefully. For this activity to be as effective as possible, it is critical that the majority of the committee consist of workers (not instructors) that are involved on a daily basis in the occupation, as well as individuals directly responsible for the "hire or not hire" decision. The committee should represent a mix of small and large businesses to minimize bias from either source. This mix of expertise will provide feedback as to specific skills workers in the occupation actually perform, rather than instructor opinion of performance requirements. Although instructors read professional journals and have contact with individuals in the occupation, incumbent worker and supervisor review of the skill standards set is the best method for identifying tasks currently performed in the occupation.

There are six essential questions that must be asked of the team members until such a time that the team leader can be assured that the process has yielded a quality set of standards for local use. The first three questions are to be asked of the team members for every skill standard on the list, and the fourth should be asked at appropriate points in the review process, normally at the end of a Duty section review. (A "Duty" is a term used to collect standards together, with an example being "Diagnosing Automotive Drivability Problems".) The fifth question provides information on specifics that **must** be considered when developing materials for a preparation program.

1. Does this standard represent a skill presently performed in the occupation? (If no, it should be eliminated from the list.)
2. Is the wording appropriate, does it convey the same message to each team member?
3. Can a performance standard and at least four test items be developed for the skill?

4. What skill standards need to be added to the list due to changing technology? (In many instances, the skill does not change. The change is in how the skill is performed, and this will be identified at the skill analysis phase.)

5. Which of the skills on the list are entry level? In this instance, entry level is defined as those skills an individual will be required to perform within 90 days of being employed.

6. Finally, which of these skills are critical to competent performance? Critical skills are those that if not competently performed, damage to an individual or equipment may result.

Use of this process will provide documentation for the development of an "Industry Transportable Skill Certificate" that can be correlated (to the degree possible) with a national skill standard set. Unfortunately, there appears to be a small probability of the emergence of numerous business-industry accepted national certification processes as a result of this work. The automotive technician certification system (ASE) continues to be the singular example of a nationally coordinated, industry based, locally recognized individual certification program. Ultimately, there is a question as to whether there will ever be a significant national certification processes beyond the automotive technician profession, given lack of nationally representative associations in the majority of occupational areas.

An additional confounding issue is the reference to and mandate of "standards" identified in other venues, specifically Perkins II. Instructors and other technical education deliverers are now familiar with "Perkins Standards", which although related to the national skill standards sets, generally deal with aggregated data on cohorts of students in a specific program. The Perkins standards deal with programs, but the National Skill standards theoretically define individual performance on the job or in an "industry".

Another element of the emergent skill standards that was referred to earlier, "The skill standards ... must also be tied to measurable, performance based outcome that can be readily assessed ... ", has potential impact on technical educators. The reference to "measurable", and "performance based", directly relates to another process conducted by experienced instructional developers -- the development of "performance standards".

Performance Standards

A performance standard defines the level or criterion for competent skill performance. A performance standard is defined as "an operational definition of competent skill performance", indicating (at least implicitly) that this performance was by an *individual*. Confounding the issue, however, is the Perkins II context, wherein a performance standard is at the *program* level. For this discussion, the two types of performance standards will be classified as *student performance standards* and *program performance standards*.

The definition of a student performance standard as "an operational definition of competent performance" indicates that the student standard is stated to precisely describe the elements of competent performance, with specific decision criteria attached to those elements.

Student performance standards are one of the most difficult, if not the most difficult, items to develop. When workers are asked to develop the standards for competent skill performance, it requires a great deal of probing to solicit useful information as to how competent performance is determined.

The major developmental challenge is assuring inter-rater reliability. The student performance standard must be stated in such a manner that multiple observers can review performance or product, and determine (using the criteria) whether or not the student has mastered task performance. Once determined, these criteria form the basis for developing assessments that will be used to determine student competency.

V-TECS has developed a list of "primer" questions that can be used by the analyst to help identify task/*student performance standards*, but it requires skill and perseverance on the part of the analyst to develop these standards. When instructors are asked to develop performance standards without the benefit of skill standards, they tend to talk in terms of instructional tests, not business/industry standards.

It is worth noting that in many instances, the student performance standards for the "school house" will differ from the "business-industry standards" due to environmental constraints in the classroom/laboratory/shop. Environmental constraints in this instance relate to different types of equipment that are found in schools, although this constraint has also impeded the skills standard development process. Obvious examples of constraints in standard development are different electronic ignition systems on GM and Ford, and different operating systems in the Mac and DOS

world. These differences cause developers significant headaches, but must be addressed in the analysis process. The criteria used by V-TECS states in their performance standards development efforts follow.

V-TECS PERFORMANCE STANDARD CRITERIA

A standard is the job based criteria used to determine if a task has been successfully or unsuccessfully performed.

Standards may take many forms, including a description of:

- · The appearance of the products of competent performance;
- · Key points in the process;

(Checklists should not be considered for use unless incumbent workers actually use a check list on the job.)

- · Time limits imposed;

(A time limit should never be the only point of determining acceptable performance; rather, it should be accompanied by quality requirements. If time is not a critical element, do not include it in the standard.)

- · The degree of accuracy required in performing the task;
- · Combinations of the above.

NOTE: Constant reference to the performance steps will help the writer (analyst) zero in on a more representative standard for accurately measuring performance.

Conclusion

Simply stated, given the diversity of developmental processes, only a limited number of products will be useful for developing curriculum and related assessment processes. They may however, provide a valuable tool for developing a dialogue with local business and industry. Meeting with local employers, using the standards and a known good set of materials, clearer definitions of local employment needs can be determined. Obviously, this has little benefit in developing "industry transportable skill certificates", a challenge to be met by organizations such as V-TECS and cooperating states.

Although there has been occasional flurries of publicity and rhetoric surrounding the project products, flawed development will doom most of the products to obscurity. Quality occupational analysis will continue to be the base for developing skill certificates, vocational technical curriculum, and related assessment processes for program development and improvement. The usefulness of most of the DOE and DOL Skill Standards project products for these purposes, however, will be problematic at best.

VOLUNTARY SKILL STANDARDS

ADVANCED HIGH PERFORMANCE MANUFACTURING
Technical Workers
Contact: C.J. Shroll, Foundation for Industrial Modernization, 1331 Pennsylvania Avenue, N.W., Suite 1410, N. Tower, Washington, D.C. 20004-1703. Telephone: 202-662-8968.

AGRICULTURAL BIOTECHNOLOGY
Agricultural Biotechnology Technician
Contact: Jeff Moss, National FFA, Project Director, 116 Sheringham, Normal, IL 61761.
Telephone: 309-862-3838.

AIR CONDITIONING, HEATING AND REFRIGERATION
Air-conditioning, heating, and refrigeration technicians in residential and commercial environments
Contact: Victor Harville, V-TECS, Southern Association of Colleges and Schools, 1866 Southern Lane, Decatur, Georgia 30033-4097. Telephone: 800-248-7701.

AUTOMOBILE, AUTOBODY, AND MEDIUM/ HEAVY TRUCK
Entry level automobile, auto body, and medium/heavy truck technicians
Contact: Pat Lundquist, NATEF, 13505 Dulles Technology Drive, Herndon, Virginia 22071-3415.
Telephone: 703-793-0100.

BIOSCIENCE
Beginning level bioscience technical specialists (Standards for entry level specialists cover twenty related occupations.)
Contact: Judith Leff, Education Development Center, 55 Chapel Street, Newton, Massachusetts 02158.
Telephone: 617-969-7100 X2373.

CHEMICAL PROCESS INDUSTRIES
Entry level chemical laboratory technicians and process technical operators
Contact: Kenneth Chapman, American Chemical Society, 1155 Sixteenth Street, N.W. Washington, D.C. 20036.
Telephone: 202-872-8734.

COMPUTER AIDED DRAFTING AND DESIGN
Computer Aided Drafting and Design (CADD) users across all industries
Contact: John Morrison, Foundation for Industrial Modernization, 1331 Pennsylvania Avenue, N.W., Suite 1410, North Tower, Washington, D.C. 20004-1703. Telephone: 202-662-8905.

ELECTRICAL CONSTRUCTION
Electrical Construction Worker, Electrical Line Construction Worker, and Electrical-Residential-Construction Worker
Contact: Charles Kelly, National Electrical Contractors Association, 3 Bethesda Metro Center, Suite 1100, Bethesda, Maryland 20814-5372. Telephone: 301-657-3310.

ELECTRONICS
Manufacturing Specialist, Administrative/Information Services Support, Pre/Post Sales
Contact: Cheryl Fields Tyler, American Electronics Association, 5201 Great American Parkway, Box 54990, Santa Clara, California 95056. Telephone: 408-987-4289.

ELECTRONICS
Entry level electronics technicians (covers those employed within basic and applied research, product development, manufacturing, marketing, maintenance, and repair of electronic components, devices and systems)
Contact: Irwin Kaplan, Electronic Industries Foundation, 919 18th Street, N.W., Suite 900, Washington, D.C. 20006.
Telephone: 202-955-5810.

GROCERY
Customer Service/Stock Associate and Front-end Associate (encompasses all entry level positions)
Contact: Jim Williams, National Grocers Association, 1825 Samuel Morse Drive, Reston, Virginia 22090.
Telephone: 703-437-5300.

HAZARDOUS MATERIALS MANAGEMENT TECHNOLOGY
Entry Level Hazardous Materials Management Technician (encompasses several job titles)
Contact: Jim Johnson, Center for Occupational Research and Development, 601 Lake Air Drive, Waco, Texas 76710.
Telephone: 817-772-8756.

HEALTH CARE
Health care core (applying to all workers in health services) and four occupational clusters: therapeutic; diagnostic, information services; and environmental services.
Contact: Dr. Sri Ananda, Far West Laboratories, 730 Harrison Street, San Francisco, CA 94107-1242. Telephone: 415-241-2712.

HEAVY HIGHWAY/CONSTRUCTION & ENVIRONMENTAL REMEDIATION
Pipe laying work, concrete work, lead remediation, and petrochemical remediation
Contact: John L. Tippie, Laborers-AGC Education and Training Fund, P.O. Box 37, 37 Deerfield Road, Pomfret Center, Connecticut 06259. Telephone: 203-974-0800.

HOSPITALITY AND TOURISM
Front-line positions in hospitality and tourism industry. Four are from food service - server, host, cashier, and busser, and four are from lodging - front desk associates, reservationist, bellstand, and concierge.
Contact: Doug Adair, Council on Hotel, Restaurant, and Institutional Education, 1200 17th Street, N.W. Washington, D.C. 20036-3097. Telephone: 202-331-5990.

HUMAN SERVICE
Entry level human service occupations (cluster includes, case managers, job coaches, and residential support staff)
Contact: Marianne Taylor, Human Services Research Institute, 2335 Massachusetts Avenue, Cambridge, Massachusetts 02104.
Telephone: 617-876-0426.

INDUSTRIAL LAUNDRY
Production workers and Maintenance Technicians (These occupations include most of the non-degreed workers in the industry.)
Contact: Geoffrey Northey, c/o Uniform and Textile Service Association, 1730 M Street, N.W., Suite 610, Washington, D.C. 20036. Telephone: 703-938-5057.

METALWORKING
Machining, Industrial Equipment, Tooling and Metal forming Technicians
Contact: William Ruxton, Vice President, National Tooling and Machining Association, 9300 Livingston Road, Ft. Washington, Maryland 20744. Telephone: 301-248-6200.

PHOTONICS
Photonics Technicians (cluster includes workers in the following specialties: Defense/Public Safety/Aerospace, Medicine, Computers, Communications, Manufacturing/Test and Analysis, and Environmental/Energy/Transportation.
Contact: Darrell Hull, CORD, 601 Lake Air Drive, Waco, Texas 76710. Telephone: 817-772-8756.

PRINTING
Prepress/Imaging, Press, and Binding/Finishing/Distributing
Contact: Jack Simich, Graphic Arts Technical Foundation, 4615 Forbes Avenue, Pittsburgh, Pennsylvania 15213-3796.
Telephone: 412-621-6941.

RETAIL
Professional Sales Associate
Contact: Rob Hall or Kathy Mannes, National Retail Federation, 325 Seventh Street, N.W., Suite 1000, Washington, D.C. 20004.
Telephone: 202-783-7971.

WELDING
Entry Level Welder (a semi-skilled, production worker requiring significant supervision)
Contact: Nelson Wall, American Welding Society, 550 N.W. LeJeune Road, Miami, Florida 33126. Telephone: 305-443-9353.